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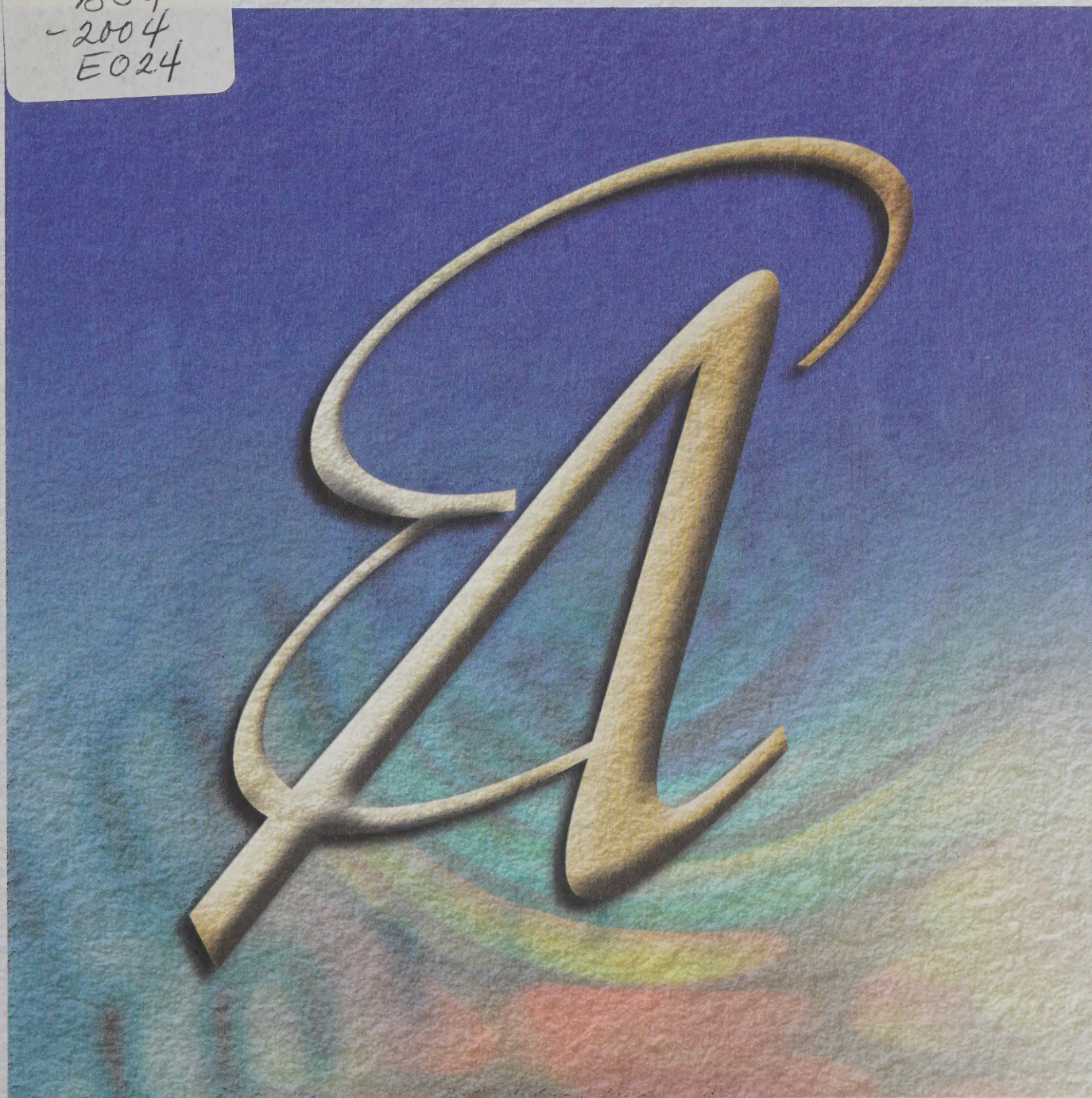
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*Catching Up and Falling Behind: The Performance of Provincial
GDP per Capita from 1990 to 2003*

by John R. Baldwin, Mark Brown, Jean-Pierre Maynard and Danielle Zietsma

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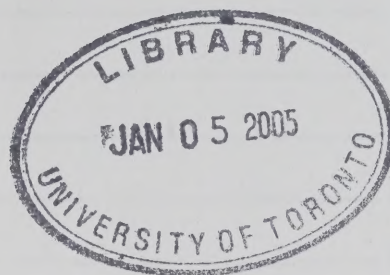
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Abstract

This paper compares GDP per capita across Canadian provinces over the period from 1990 to 2003. It starts by examining relative GDP per capita measured in current dollars across provinces and over time. The second section breaks down growth in nominal dollar GDP into a price and a volume component asking whether growth over the period came from an increased volume of real output or increases in the prices received for the products being produced. Finally, the third section asks whether increases in the volume component (real GDP per capita) are related to changes in productivity or changes in labour market conditions.

Among the provinces, the most striking performer was Alberta. Its GDP per capita increased rapidly over the period, leaving the other nine provinces well behind by 2003. Almost equally striking has been the increasingly similar levels of provincial per capita GDP when Alberta is excluded. The per capita GDP of most provinces moved closer to national levels over the period. This was especially true of Newfoundland and Labrador whose GDP per capita rose at a break-neck pace after 1997.

Keywords: Real and nominal; provincial; gross domestic product per capita; labour productivity; labour market conditions; employment rate; and hours worked per job.

Executive summary

This paper examines the differences in growth rates of GDP (Gross Domestic Product) per capita across provinces and territories in two periods, 1990-1997 and 1997-2003. It focuses both on changes in nominal or current dollar GDP and on real or constant dollar GDP.

The current dollar GDP per capita of Alberta starts the 1990s above the national average and moves up over time thereby increasing the gap between Alberta and the rest of Canada. Saskatchewan begins the decade behind the national average but moves upward over time. Newfoundland and Labrador starts well behind the national average and moves up to substantially close the gap between itself and the national average. The other Atlantic Provinces also tend to increase their relative position but by smaller amounts. Ontario and British Columbia see their relative position deteriorate over the same period. Ontario is still above the national average by the end of the period, but British Columbia moves further below it.

Overall, this period is characterized by two striking trends. The first is the increasingly singular nature of Alberta's performance. The other nine provinces have clearly fallen behind Alberta. This second is the increasing similarity of the levels of provincial per capita GDP among these remaining nine—most provinces were closer to national per capita GDP levels by the end of the period.

Changes in nominal GDP per capita are caused both by changes in the relative growth rates of the volume of output and of the relative growth of the prices received for the products of different provinces. The rates of growth of the 'real' and the price component vary considerably by province. In the period 1990-1997, Saskatchewan and Alberta have the highest growth in GDP per capita and this growth comes primarily from the growth in real output, though the growth in the prices received for the output of Saskatchewan was among the highest in Canada. British Columbia had very low growth in real output in the early 1990s, but above average growth in the prices that it received during this period. In the second period, Alberta continued to grow its GDP per capita at a faster rate than the national average—but this growth came primarily from above average rates of growth in the prices received for its products. On the other hand, the Atlantic Provinces generally enjoyed real growth in the second period that was superior to the national average. In addition, the price component was also superior in the Atlantic Provinces. Together, both the real and the price component in the Atlantic Provinces contributed to their superior performance during the latter part of the decade.

The paper also investigates the factors behind the growth in real GDP per capita. We find that growth rates of provincial GDP per capita in the 1990-1997 period are relatively small compared to those in the 1997-2003 period. Furthermore, a reversal of fortunes is found to have taken place; that is, provinces that grew their real GDP per capita at a relatively faster pace in the 1990-1997 period, grew at a relatively slower pace in the 1997-2003 period—and vice versa. The relatively high growth in real GDP per capita experienced by the Atlantic Provinces in the 1997-2003 period means that these provinces started to close the gap with the national level of GDP per capita. During the 1997-2003 period, Newfoundland and Labrador's high growth in real GDP per capita leads the nation. This is in contrast to British Columbia who experiences lackluster

growth in real GDP per capita in the 1990s. Via a decomposition technique that examines the underlying components of real GDP-per-capita growth, the paper finds that those provinces with high growth rates in real GDP per capita also experienced high growth in labour productivity as well as favourable labour market conditions that contributed to the growth in GDP per capita.

Introduction

The success of an economy is often measured using Gross Domestic Product (GDP) per capita—a measure subject to a number of well-known criticisms as a welfare indicator, but nonetheless a meaningful indicator of an economy's ability to produce marketed goods and services. GDP captures the money value of goods and services that are available to the nation from economic activity. When divided by the population of a region, it provides a measure of the amount of goods and services produced per person in the region.

Frequently, GDP per capita has been used to measure differences across countries in the value of goods and services produced. Recently, the improvement and expansion of the provincial economic accounts has made it possible to do the same across Canadian provinces. This has led Statistics Canada to initiate a research program that examines provincial economic performance.

Following this line of research, this paper examines growth rates in GDP per capita during two different periods—1990-1997 and 1997-2003. The first period was marked by a major recession and a restructuring of the economy that resulted in part from the implementation of the free trade agreements. In contrast, the second period was one of relatively strong economic growth and a revival of productivity growth. Therefore, this study examines whether each of the provincial economies performed equally well in times of slow and strong economic growth or whether the size of the regional disparities changed over time.

The paper begins by comparing the relative size of the provincial economies—using nominal or current dollar GDP per capita as the metric. It then asks whether changes in GDP per capita came from differential growth across provinces in the volume of real output or in prices.

Overall, the paper shows that there were two striking trends in relative levels of GDP per capita across the provinces over the 1990 to 2003 period. The first was the increasingly singular nature of Alberta's performance. The other nine provinces have clearly fallen behind Alberta. The second was the increasing similarity of the levels of provincial per capita GDP among these remaining nine—most provinces were closer to national per capita GDP levels by the end of the period.

In addition to examining economic growth rates, the paper also investigates the relative contributions of the four main drivers to growth in real GDP per capita for each of the provinces. Specifically, growth in GDP per capita is decomposed into components related to labour productivity, hours worked per person, the percentage of eligible people who are employed and the percentage of the population who are of working age.

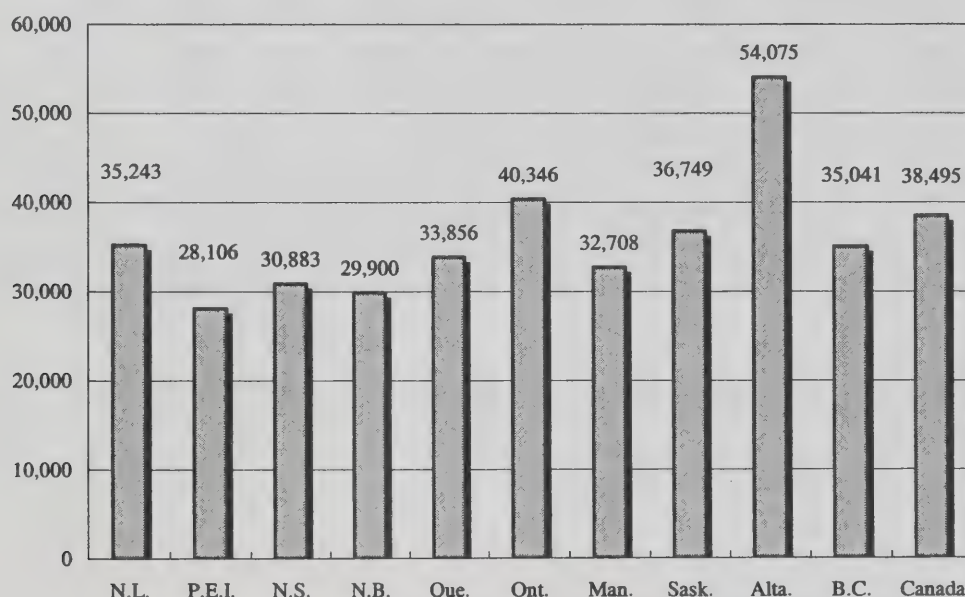
The remainder of the paper is organized as follows. First, the levels of 2003 GDP per capita in current prices by province is presented, followed by the provision and discussion of real GDP per capita growth rates in each of the provinces during the 1990-1997 and 1997-2003 periods. Subsequently, growth in real GDP per capita is decomposed into its main components for the 1990-1997 and 1997-2003 periods. Next, a section is devoted to the Canadian North. A summary of the key findings concludes the paper.

Nominal GDP per capita in 2003

As a background to the investigation of the change in performance of Canadian provinces over time, we provide a snapshot of the way GDP per capita in current dollars is distributed across the Canadian provinces in 2003.

On the basis of nominal GDP per capita in 2003, economic performance in Canada differs across provinces (Figure 1). Ontario and Alberta outpace other provinces in terms of nominal GDP per capita—at \$40,346 and \$54,075, respectively.¹ But the majority of Canadian provinces reported lower GDP per capita in 2003 compared to the national average (\$38,495). These include: the Atlantic Provinces, Quebec, Manitoba, Saskatchewan and British Columbia. Output per person is unevenly distributed across Canadian provinces, with a level of GDP per person in Alberta that is almost twice that of Prince Edward Island.

Figure 1. Nominal GDP per capita of Canadian provinces, 2003 (dollars)



1. It is worth noting that interprovincial differences in GDP per capita are not the same as differences in personal income or consumption per capita—two other measures that are sometimes used as measures of well-being. This is because corporate profits, a component of GDP, are not necessarily spent in the province of origin. Moreover, GDP does not take into account government transfers, which are an important source of income for people living in some provinces. For example, using GDP per capita produces a 50% gap between the highest performing and the least performing province. This figures drop to 30% when the measure of personal income is used. See Table B in Appendix I.

These differences in nominal GDP per capita reflect differences in prices, labour productivity, demographic factors and industrial structure across provinces.²

Differences exist in the prices of goods and services across provinces.³ For example, housing prices are higher in Ontario than in Quebec. Létourneau develops an intercity price index for consumption that takes on a value of 105.8 for Toronto in 1988 but only 96.8 in Halifax.⁴ To compare 'real' GDP per capita across provinces, adjustment using purchasing power prices (PPPs) are required to take into account differences in the cost of living. At present, Statistics Canada does not produce provincial PPPs.

Provincial differences in GDP per capita also stem from differences in the industrial structure of the economies of provinces. Some provinces support industries that have very high labour productivity. In general, labour productivity levels are higher in provinces where the industrial structures are capital intensive. For example, the oil and gas extraction sector, a dominant industry in Alberta's economy, is capital intensive and explains, in part, Alberta's leading position in terms of GDP per capita.

Third, part of the observed differences in GDP per capita in current dollars can be explained by the differences in work effort. For example, Alberta, which possessed the highest 2003 GDP per capita also displays the highest number of hours worked per person of 15 years of age and over (see Figure 2). In 2003, the population 15 and over in Alberta devoted 1259 hours per year at work. This represents 126 hours more than second place Prince Edward Island. In contrast, the Atlantic Provinces that rank among the lowest in terms of GDP per capita levels are also the provinces where the working-age population devotes less than the national average to working time.

In this note we do not pursue which of these explanations serves to account for the differences outlined in Figure 1.⁵

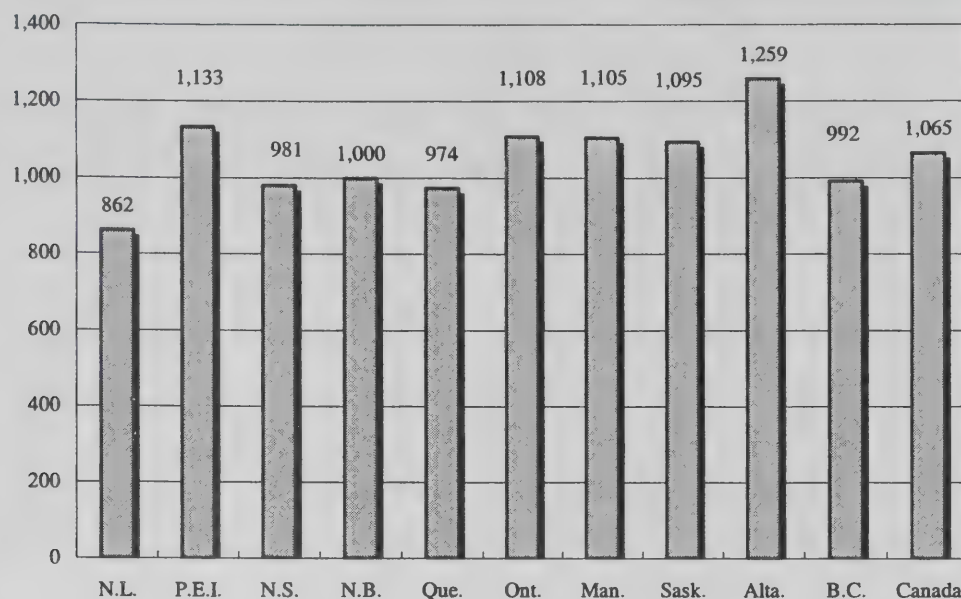
2. Note that GDP per capita can be decomposed into the product of GDP per hour and labour utilization (or hours per person). See succeeding section on the sources of real GDP per capita by province for details on the nature of this decomposition.

3. See R. Létourneau (1992). « Un indice de prix régional de biens et services comparables au Canada, » Document de travail. No. 92-02. Fiscal Policy and Economic Analysis Branch. Department of Finance.

4. See Létourneau (1992).

5. For one such study, see Baldwin, J., J-P. Maynard, D. Sabourin, D. Zietsma. 2001. "Differences in Interprovincial Productivity Levels," *Canadian Economic Observer*. August. pp. 3.1-3.10

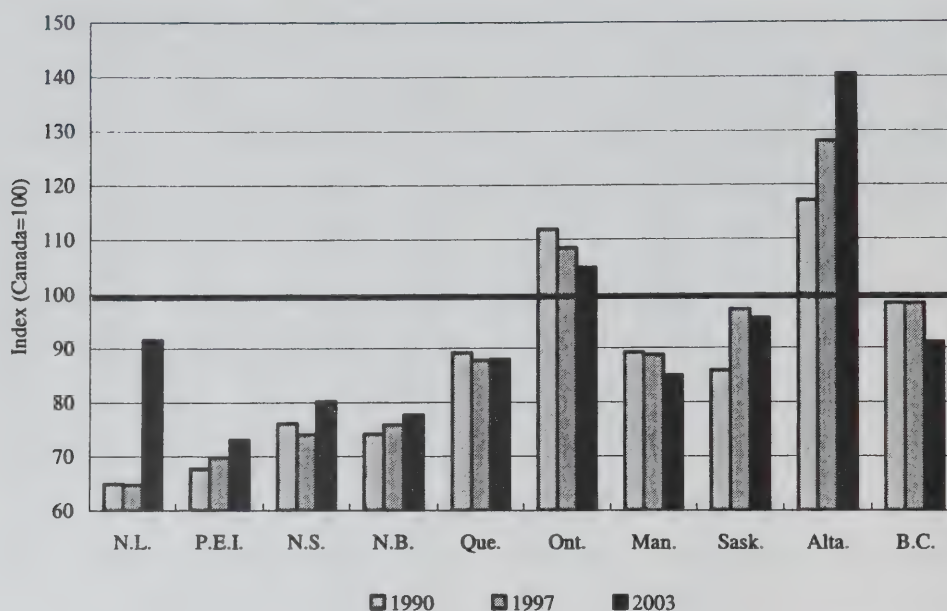
Figure 2. Hours worked per person of 15 years old and over: 2003



Since 1990, there have been changes in the relative position of the Canadian provinces. In Figure 3, we plot the nominal value of GDP per capita in each province in 1990, 1997, and 2003 relative to the Canadian average for that same year. In the figure, an increase in the height of a bar indicates that the province has moved up relative to the national average. A decrease indicates that it has fallen behind.

The eastern provinces have made considerable headway in decreasing their gap with the national average. Newfoundland and Labrador saw its GDP increase from 65% of the national average in 1990 to 92% in 2003. Nova Scotia, New Brunswick and Prince Edward Island also experienced increases, but they involved smaller percentage point gains. In the West, Manitoba and British Columbia experienced losses that pulled them further below the national average, with British Columbia falling from essentially parity in 1990 to over 9 percentage points below the average by 2003. Ontario descended from being 12 percentage points above the average to only 5 percentage points above in 2003. In contrast, both Alberta and Saskatchewan moved up. In Saskatchewan's case, GDP per capita moved from 86% to 95% of the average. In Alberta's case, GDP per capita moved from 117% to 140% of the average between 1990 and 2003.

Figure 3. Nominal GDP per capita by province relative to the National average: 1990, 1997, and 2003



Factors behind GDP per capita growth

The growth in GDP per capita experienced by each province can be divided into two main components—the growth that came from increases in the volume of production per capita holding the price structure constant (often referred to as the growth due to ‘real’ output change) and the increases due to changes in the prices of output. The first component comes both from increases in productivity and increases in the amount of work effort derived from the population of each province. The second component arises from increases in the prices being received for provincial output. The latter may come from general inflation—or from changes in very specific parts of the economy. The recent commodity price boom would have led to greater price increases for those provinces who specialized in certain products—such as energy and other natural resources.

The two components of growth are presented in Table 1 by province and for Canada as a whole for each of two periods—1990-1997 and 1997-2003. On the whole, there is more variation in the rates of growth of the real component than there is for the price component. The standard deviation of the rate of change of prices is about half as large as the standard deviation of the real rates of growth—in both the early and late 1990s. This indicates that the underlying forces that drive the volume of ‘real’ output are more variable across provinces than are the forces that drive up prices over time. This is what would be expected if most of the price pressure came from inflationary trends that were common across provinces. During the early 1990s, the increase in prices in most provinces is less than 1 percentage point different from the national average. But there are clearly specific trends that are felt in some provinces more than others. During the early

1990s, both British Columbia and Saskatchewan enjoyed a higher growth in the prices received for their products than did most other provinces. This is also true for Alberta in the second period.

Table 1. Components of average annual growth in nominal GDP per capita

Province	Overall GDP per capita 1990-1997	Real component 1990-1997	Price component 1990-1997	Overall GDP per capita 1997-2003	Real component 1997-2003	Price component 1997-2003
Percentage						
N.L.	2.6	1.1	1.5	10.7	7.8	2.7
P.E.I.	3.1	2.0	1.1	5.3	2.9	2.4
N.S.	2.3	0.8	1.4	5.9	3.5	2.3
N.B.	3.0	1.4	1.6	4.9	3.5	1.4
Que.	2.4	0.9	1.6	4.6	2.9	1.6
Ont.	2.2	0.6	1.6	3.9	2.7	1.2
Man.	2.6	0.9	1.7	3.8	2.1	1.7
Sask.	4.5	2.1	2.3	4.2	2.0	2.2
Alta.	4.0	2.2	1.7	6.1	1.4	4.7
B.C.	2.7	-0.1	2.7	3.2	1.8	1.4
Canada	2.7	0.9	1.7	4.5	2.7	1.8

It is evident that both the 'real' and the price component vary considerably by province. In the first period, Saskatchewan and Alberta have the highest growth in GDP per capita and this growth comes mainly from the growth in real output, though the growth in the prices received for the output of these two provinces was among the highest in Canada. British Columbia had very low growth in real output in the early 1990s but above average growth in the prices that it received during this period. In the second period, Alberta continued to grow its GDP per capita at a faster rate than the national average—but this growth came primarily from above average rates of growth in the prices received for its products. On the other hand, the Atlantic Provinces generally enjoyed real growth in the second period that was superior to the national average. In addition, their price component was also higher. Together, both the real and the price component in the Atlantic Provinces contributed to their superior performance during the latter part of the decade. In the 1997-2003 period, British Columbia continued to have below average real growth but saw the prices that it received also fall below the national average. Ontario's overall growth did not exceed the national average during the entire period because its real component was lower than the national average. Quebec was in the same position early in the decade but enjoyed superior growth in the volume of output in the late 1990s.

Real GDP per capita growth

Interprovincial differences in the real component of the growth in GDP per capita can come from different sources. In this section, we examine interprovincial differences in the real component of the growth of GDP per capita in the 1990s and ask how much comes from productivity growth.

Nationally, the growth rate in real GDP per capita in the 1997-2003 period is three times that experienced in the 1990-1997 period (Table 2). The slow growth in real GDP per capita in the 1990-1997 period reflects the sharp recession of the early 1990s. In the early 1990s, the effects of the recession were compounded by restructuring associated with the implementation of the Canada-U.S free trade agreements. The 1997-2003 period was characterized by a major turnaround in almost all key indicators of economic activity: unemployment fell, inflation remained in check, and there was a surge in economic growth.

Table 2. Average annual growth rate of real GDP per capita

Province	1990-1997	1997-2003	Change (percentage points)
Percentage			
N.L.	1.1	7.8	6.7
P.E.I.	2.0	2.9	0.9
N.S.	0.8	3.5	2.7
N.B.	1.4	3.5	2.0
Que.	0.9	2.9	2.1
Ont.	0.6	2.7	2.1
Man.	0.9	2.1	1.2
Sask.	2.1	2.0	-0.1
Alta.	2.2	1.4	-0.9
B.C.	-0.1	1.8	1.8
Canada	0.9	2.7	1.8

The increase in the growth rate of real GDP per capita between 1997 and 2003 is broad-based (see Table 2). Most, but not all, provinces increased their rate of growth in real GDP per capita. The most remarkable increase in GDP per capita in the 1997-2003 period took place in Newfoundland and Labrador, with growth at 7.8% compared to 1.1% between 1990 and 1997. In Ontario and Quebec, the average annual growth rate of GDP per capita between 1997 and 2003 exceeds that in the 1990-1997 period by at least 2 percentage points. In fact, real GDP per capita grew more rapidly in the post-1997 period, compared to the earlier period in all provinces but Saskatchewan and Alberta. It has remained largely unchanged in Saskatchewan, while it decreased in Alberta.

In contrast to the 1990 to 1997 period, growth in real GDP per capita from 1997 to 2003 was stronger east of Ontario. Average annual growth in GDP per capita in these provinces in 1997 to 2003 was at least three percent. In contrast, a slower pace in the growth of GDP per capita (in the neighbourhood of one to two percent) was observed from Ontario to British Columbia over the same period. Both Alberta and Saskatchewan experienced a relatively high rate of growth in real

GDP per capita compared to other provinces in the 1990-1997 period. This pace of growth, however, was not sustained in the 1997-2003 period for Alberta where growth slowed down by one percentage point. Although British Columbia increased its growth rate between periods, it still was below the national average over the 1997-2003 period.

Although the difference in growth rates between periods and provinces may appear small, minor differences in growth rates can lead to very large differences in the level of real GDP per capita in the long run. To illustrate, at the 2.2% average annual rate of growth in real GDP per capita experienced by Alberta in the 1990-1997 period, it would take 32 years for real GDP per capita to double. At the average annual growth rate of 1.4% experienced between 1997 and 2003, it would take 50 years for real GDP per capita to double. Therefore, relatively small differences in growth rates can make a very big difference in standards of living over time. In light of the large effect of small differences in growth rates, the potential impact of large rate differences on growth in GDP per capita is remarkable, giving the provinces with higher growth rates the opportunity to close or open the gap between their GDP per capita and the national average. In Newfoundland and Labrador, for example, it would take 64 years for GDP per capita to double at its 1990-1997 growth rate (1.1%), but only 10 years for GDP per capita to double at its 1997-2003 growth rate (7.8%).

While British Columbia has traditionally been considered as one of the most prosperous provinces, after 1995 its level of nominal GDP per capita falls below national nominal GDP per capita and continued every year up to 2003. Conversely, Newfoundland and Labrador began to make remarkable and consistent gains relative to the national level of GDP per capita. By 2003, British Columbia and Newfoundland and Labrador had converged to similar levels of current dollar GDP per capita (see Figure 3).

The sources of real GDP per capita growth

As we have shown above, in the 1990-1997 and 1997-2003 periods, there was considerable variation in the growth rates of real GDP per capita across provinces. In order to gain a better understanding of why these differences occurred, we measure the contributions of several factors to the growth in real GDP per capita. These factors relate to underlying demographic shifts in provincial populations, the strength of their labour markets and the productivity of their enterprises.

Specifically, the level of real GDP per capita produced by an economy is a function of several different factors. First, it will depend upon the proportion of the working age population that can be gainfully employed in producing the goods and services that are captured in measures of GDP. This proportion is determined by demographic factors. In some economies, the total population will have a large percentage of children or elderly who are not members of the labour force. *Ceteris paribus*, this means there will be less produced per capita. Demographic shifts can affect growth in GDP per capita by increasing or decreasing the size of the working age population.

The second factor that determines GDP is the employment rate—the percentage of the potential labour force (defined here as the population 15 years of age and over) that are employed. *Ceteris paribus*, the larger the percentage of the potential labour force that is employed, the higher will be GDP. The employment rate will capture the number who choose to work, but will also partly represent the effect of the labour market on these individuals' ability to find employment.

The third factor is the intensity of work, or how many hours people are working. More hours worked generally leads to greater output. The hours worked per employee depend both on labour market conditions, the desire for work time, and institutional constraints.

Finally, GDP per capita levels will depend upon productivity. When GDP per hour worked is higher, GDP itself will be larger for a given amount of hours worked.

Together, these factors—how many people in the total population are available for work, the percentage of these who find employment, the hours worked per employed person, and the productivity of these hours worked—can be combined mathematically using an identity to relate each and all of these factors to GDP per capita in a region. This identity consists of components representing labour productivity, the intensity of work effort, the employment rate, and the share of the population in the labour force. These various factors are affected by technology, labour-market conditions and demographics. Use of this identity is helpful in that it allows us to concentrate on which of these factors have contributed to the growth rates of GDP per capita in each of the provinces and to compare them relative to one other.

The growth in real GDP per capita expressed in percentages (the symbol Δ represents the percentage rate of growth), can be written as follows⁶:

$$\Delta \frac{GDP}{Pop} \equiv \Delta \frac{GDP}{Hours} + \Delta \frac{Hours}{Employment} + \Delta \frac{Employment}{Pop^{15+}} + \Delta \frac{Pop^{15+}}{Pop}$$

where:

GDP	=	Gross domestic product (overall economy)
Hours	=	Total hours worked (overall economy)
Employment	=	Number of people employed (measured here by jobs)
Pop ¹⁵⁺	=	Working age population (15 years and over) ⁷
Pop	=	Total population

Each of the four terms of the GDP decomposition captures the contribution of different factors to the overall growth rate of GDP per capita. The first term on the right hand side of the equation measures the contribution made by growth in labour productivity.⁸ The second term on the right

6. Wells, S., J.R. Baldwin, and J.P. Maynard. (2000) "Productivity Growth in Canada and the United States." *Isuma*. Vol. 1 (Spring 2000), Ottawa Policy Research Institute.

7. Results vary marginally when population 15+ is used versus using population 15-64.

8. Differences in labour productivity reflect, in turn, differences in capital intensity. Labour productivity level is usually higher in provinces where the industrial structure is very intensive in capital.

hand side measures the contribution of labour intensity (how hard the employed work in terms of hours per employee). The third term measures the contribution of the employment of the working age population (employment rate) in each province to growth in GDP. Taken together, the labour intensity and employment rate terms measure the effects of underlying labour market conditions. The last term, the demographic component, captures the growth in the potential workforce, or the working-age population.

Table 3. Sources of real GDP per capita growth (average annual growth rates in percent), 1990-1997

Province	Labour productivity (GDP/hour)	Labour intensity (Hours/job)	Employment rate (Jobs/pop15+)	Working-age population (Pop15+/Pop)	GDP/capita
N.L.	1.7	-0.2	-1.2	0.7	1.1
P.E.I.	2.3	-0.2	-0.4	0.3	2.0
N.S.	1.1	-0.1	-0.4	0.2	0.8
N.B.	0.5	0.3	0.2	0.4	1.4
Que.	1.6	0.0	-0.9	0.2	0.9
Ont.	1.3	0.1	-0.8	0.0	0.6
Man.	0.4	0.3	0.1	0.1	0.9
Sask.	1.8	0.1	-0.1	0.3	2.1
Alta.	1.8	0.0	0.2	0.3	2.2
B.C.	0.2	-0.4	0.0	0.2	-0.1
Canada	1.3	0.0	-0.5	0.1	0.9

Applying this decomposition method to growth in real GDP per capita over the periods 1990-1997 and 1997-2003, we examine the contribution of each of these components to growth in provincial GDP per capita.

Overall, Alberta demonstrates the most growth in real GDP per capita between 1990 and 1997, closely followed by Saskatchewan and Prince Edward Island (Table 3). While Central Canada experiences overall growth in real GDP per capita of less than one percent, British Columbia exhibits slightly negative overall growth in GDP per capita.

Between 1990 and 1997, the major component driving growth in real GDP per capita is labour productivity. In most provinces, this productivity performance was partly offset by a deterioration of the labour market. The 1990-1997 period was marked by a severe recession followed by a sluggish recovery due to economic restructuring.

Only Alberta, New Brunswick and Manitoba exhibit slight positive growth in the ratio of employment to the working-age population (Jobs/Pop15+) during this period. They were the only three provinces where the rate of growth in this component did not negatively affect growth in GDP per capita. Nationally, this component was negative, reducing growth in GDP per capita by 0.5%. Ontario and Quebec experienced even larger declines. The decline reflects a relatively unfavourable labour market for those seeking employment in the early 1990s.

Overall, the growth in the hours worked per job showed no change during this period. And generally, the change in each province was quite small. But in British Columbia, hours worked per job declined by 0.4% and was the driver of its falling GDP per capita.

Summing the employment rate and labour intensity components to produce an overall labour-market component provides a more comprehensive picture of the labour market conditions in the 1990-1997 period (see Table A in Appendix I). A positive labour-market component is indicative of a favourable climate; a negative one of a harsher climate. For six provinces, the overall labour-market component is negative and thus has a dampening effect on overall growth in GDP per capita. In Newfoundland and Labrador, growth in GDP per capita is dampened by 1.3 percentage points by this component. In Quebec and Ontario, growth in GDP per capita would have been at least double their 1990-1997 rates had conditions in labour market contributed to a decline in GDP per capita. Growth in GDP per capita in British Columbia is -0.1%, but could have been as high as 0.3% had there not been a negative labour-market component, dampening growth in GDP per capita.

Table 4 contains the sources of the growth in real GDP per capita from 1997-2003, a period that stands in contrast to the previous one. Specifically, Eastern Canada experienced a rapid increase in real GDP per capita. Most notably, Newfoundland and Labrador exhibits a growth rate of 7.8% overall compared to 1.1% in the 1990-1997 period. In fact, all provinces east of Ontario experienced growth in real GDP per capita in excess of the national average of 2.7%.

In the West, Saskatchewan had about the same growth that it possessed in the 1990-1997 period. British Columbia no longer had negative growth in real GDP per capita, reporting a relatively modest positive growth in GDP per capita of 1.8%.

Table 4. Sources of real GDP per capita growth (average annual growth rates in percent), 1997-2003

Province	Labour productivity (GDP/hour)	Labour intensity (Hours/job)	Employment rate (Jobs/Pop15+)	Working-age population (Pop15+/Pop)	GDP/capita
N.L.	4.4	-0.2	2.9	0.6	7.8
P.E.I.	0.2	-0.3	2.5	0.5	2.9
N.S.	2.3	-0.4	1.2	0.5	3.5
N.B.	1.9	-0.2	1.2	0.4	3.5
Que.	1.7	-0.5	1.3	0.3	2.9
Ont.	1.9	-0.3	0.8	0.3	2.7
Man.	1.5	-0.3	0.5	0.3	2.1
Sask.	2.1	-0.5	0.0	0.5	2.0
Alta.	0.9	-0.2	0.2	0.5	1.4
B.C.	1.6	-0.1	-0.1	0.4	1.8
Canada	1.8	-0.3	0.8	0.4	2.7

As in the 1990-1997 period, the largest contributing factor to growth in real GDP per capita is the labour productivity component. Nationally, labour productivity growth accounts for the largest part of the growth in real GDP per capita. Provincially, GDP/Hour exceeds all other components in every Canadian province with the exception of Prince Edward Island. There the main source of growth in real GDP per capita arises from positive growth in the employment rate.

The effects of provincial demographics, insomuch as they contribute to the pool of eligible workers, are positive and indicate growth in the potential workforce in all provinces. This component is largest in Newfoundland and Labrador, accounting for 0.6 percentage points of the growth in real GDP per capita.

In contrast to the effect of demographics, an overall trend of declining labour intensity accompanies the growth in the potential workforce, meaning that more people are working, but those who are working, were working fewer hours on average. The most important declines here are observed in Saskatchewan (-0.5%), Quebec (-0.5%) and Nova Scotia (-0.4%). Nationally, declines in labour intensity dampen growth in GDP per capita by 0.3 percentage points. Over the second part of 1997-2003 period, between 2000 and 2003, labour intensity has been affected negatively by a change in the distribution of part-time versus full-time workers due to a return to work of many pensioners that has increased the proportion of part-time workers in the population.

Over the 1997-2003 period, eight of the ten provinces experience positive growth in the number of jobs per working-age individual (employment rate). Nationally, growth in jobs per population aged 15 and over grew by 0.8 percentage points. British Columbia and Saskatchewan are the exception. In British Columbia, a slight decline in the employment rate dampens growth in real GDP per capita.

Examining the jointly determined labour-market component (employment rate + labour intensity) provides a particularly telling picture of the effect of labour markets on growth in real GDP per capita in the 1997-2003 period (see Table A in Appendix I). In contrast to the 1990-1997 period, when labour market conditions hampered growth in GDP per capita across many provinces, the labour market had a largely positive effect on growth in GDP per capita between 1997 and 2003. Those provinces that grew relatively quickly in this period had a favourable labour market. In fact, labour market conditions dampen growth in GDP per capita only in Saskatchewan and British Columbia (by 0.6 and 0.3 percentage points, respectively). The labour market in Alberta, which was very close to full employment, makes a slight negative contribution to its GDP per capita growth. Growth in GDP per capita in Newfoundland and Labrador was particularly affected by labour market conditions. In short, had there been no contribution from the labour market, growth in GDP per capita in Newfoundland and Labrador would nearly have been cut by one third. To a lesser, but nonetheless noteworthy extent, growth in real GDP per capita in Prince Edward Island would have been 2.2 percentage points lower without improvements in the labour market.

In some provinces, specific events can be identified as potential causes for marked growth or decline in the growth of real GDP per capita. For instance, the marked growth in GDP per capita in Newfoundland and Labrador can be attributed to strong growth in both labour productivity and in the employment rate and is most likely due to the construction and operation of the Hibernia offshore oil project—contributing through its construction initially and then with the commencement of oil production.

The Canadian north

With 100,000 inhabitants, less than 1% of the Canadian population, the Territories account for one third of Canada's area. A large percentage of the economy of the North is concentrated in mining, a capital intensive sector that is subject to large price fluctuations. In light of the high concentration of its economic production in a few primary industries, the analysis of the North requires a separate discussion.

**Table 5. Sources of real GDP per capita growth in the Canadian north,
1990-1997, 1997-2003, and 1999-2003 (average annual growth rate in percent)**

Region / Period	Labour productivity (GDP/hour)	Labour intensity (Hours/job)	Employment rate (Jobs/Pop15+)	Working-age population (Pop15+/Pop)	GDP/capita
1990-1997					
Yukon	3.0	-0.4	-3.4	0.2	-0.8
N.W.T.	-0.3	-1.0	0.6	0.1	-0.7
1997-2003					
Yukon	0.4	-0.6	0.9	0.8	1.6
N.W.T.	5.1	0.0	2.2	0.5	7.9
1999-2003					
Yukon	1.7	-0.6	0.5	0.8	2.4
N.W.T.	5.3	0.2	5.2	0.6	11.8
Nunavut	-2.5	0.0	2.3	0.7	0.4

During the 1990-1997 period, although both territories experienced a decline in real GDP per capita, the sources of this decline are different: the poor performance of the labour market in the Yukon compared to decline in the labour intensity for the Northwest Territories. In the 1990s, the Northwest Territories experienced a major turnaround of their performance, a result of a surge in the mining sector from the discovery of an exploitable diamond vein 300 km from Yellowknife. This new activity has generated important spillover effects, particularly in terms of job creation in the construction and transportation sectors. A first mine began operations in 1998 and a second one began operations in 2003. The operations of these two diamond mines during the 1997-2003 period contributed to the rebound in GDP per capita in the Northwest Territories.

Another important factor that is worth noting is the creation in April 1999 of the Nunavut Territory. Its formation has triggered a flurry of construction and transportation activities over the recent years which may have affected labour productivity.

Conclusions

Substantial changes in the relative position of provinces with regards to GDP per capita have occurred since 1990. Alberta starts the 1990s above the national average current dollar GDP per capita and moves up over time to increase the gap between itself and the rest of Canada. Saskatchewan starts behind the national average, but moves upward over time. Newfoundland and Labrador starts well behind the national average and moves up to substantially close the gap between itself and the national average. The other Atlantic Provinces also tend to increase their relative position, but by smaller amounts. Ontario and British Columbia see their relative position deteriorate over the same period. Ontario is still above the national average by the end of the period, but British Columbia moves further below it.

Changes in nominal GDP per capita are caused both by changes in the relative growth rates of the volume of output and of the relative growth of the prices received for the products of different provinces. Both the 'real' and the price component vary considerably by province. In the period 1990-1997, Saskatchewan and Alberta have the highest growth in GDP per capita and this growth comes primarily from the growth in real output, though the growth in the prices received for the output of these two provinces was among the highest in Canada. British Columbia had very low growth in real output in the early 1990s, but above average growth in the prices that it received during this period. In the period 1997-2003, Alberta continued to grow its GDP per capita at a faster rate than the national average—but this growth came primarily from above average rates of growth in the prices that were being received for its products. On the other hand, the Atlantic Provinces generally enjoyed real growth in the second period that was superior to the national average. In addition, the price component was also superior in the Atlantic Provinces. Together, both the real and the price component in the Atlantic Provinces contributed to their superior performance during the latter part of the decade.

The paper shows that there were two striking trends in relative levels of provincial GDP per capita over the 1990 to 2003 period. The first was the increasingly singular nature of Alberta's performance. The other nine provinces have clearly fallen behind Alberta. This second was the increasing similarity of the levels of provincial per capita GDP among these remaining nine—most provinces were closer to national per capita GDP levels by the end of the period than at the beginning.

Growth in real GDP per capita over the 1990-1997 and 1997-2003 periods is characterized by a reversal of fortunes for most provinces. Those provinces with relatively high growth in real GDP per capita in the 1990-1997 period had relatively low growth in real GDP per capita in the 1997-2003 period and vice versa. Alberta is a classic example of this, experiencing the highest growth rate of all provinces in Canada in the 1990-1997 period and one of the lowest growth rates in real GDP per capita during 1997-2003 period. The same is true for Saskatchewan.

In contrast, Newfoundland and Labrador experienced relatively moderate growth in real GDP per capita during the 1990-1997 period and by 1997-2003 reported the highest growth rate of GDP per capita in the country—a growth rate of real GDP per capita that was over twice the growth rate in real GDP per capita of the second place finisher. Newfoundland and Labrador's pace of

growth in real GDP per capita between 1990 and 1997 would have resulted in a doubling of GDP per capita in 64 years; with the 1997-2003 pace of growth, its GDP per capita would double in 10 years.

The whole of Atlantic Canada, in general, mirrors Newfoundland and Labrador's trend with relatively low growth in real GDP per capita during 1990 to 1997 and faster growth in real GDP per capita during the 1997 to 2003 period. In short, the Atlantic provinces appear to be 'catching up' for the moment, though many still have some distance to travel before reaching the average national GDP per capita levels.

Similarly, Ontario and Quebec, who both grew at a relatively slow pace in 1990-1997, also reported far higher growth in real GDP per capita during 1997 to 2003. Between 1990 and 1997, the doubling time for real GDP per capita in Quebec would have been 78 years and in Ontario, 116 years. By 1997-2003, the growth rate was such that real GDP per capita would have doubled in Quebec after 25 years and in Ontario after 27 years.

In the 1990-1997 period, British Columbia is the only province in Canada to experience a decline in real GDP per capita. While growth in real GDP per capita in this province turned positive in the 1997-2003 period, this growth was well below national average growth in GDP per capita, and in fact, was the second lowest in Canada.

British Columbia's level of nominal GDP per capita equaled the national average at the outset of the 1990s. However, British Columbia declined below the national average by 2003. BC's decline is all the more dramatic when compared to Newfoundland and Labrador, whose nominal GDP per capita has been moving rapidly up towards the national average since 1997.

Prince Edward Island is the only province that did not suffer a reversal of fortunes. And the growth of real GDP per capita in Prince Edward Island is consistently among the highest in both the 1990-1997 and 1997-2003 periods.

Growth in GDP per capita in both periods is driven predominantly by labour productivity growth. Since labour productivity captures how effectively resources (hours worked) are being used to produce output, it is not surprising that growth in output per hour worked plays such an important role in growth in real GDP per capita in most of the provinces. Newfoundland and Labrador, the fastest growing province in Canada in the 1997-2003 period, boasted labour productivity growth that was a full 2.1 percentage points above its closest competitor.

Of the factors driving growth in real GDP per capita, labour market conditions (employment rate + labour intensity) also prove to be an influential factor. We find that the relative growth of real GDP per capita by province was influenced by labour market conditions. In the 1990-1997 period, labour market conditions largely hampered growth. It is only in the western provinces of Manitoba, Saskatchewan and Alberta during the 1990 to 1997 period where the labour market component made a positive contribution to growth in GDP per capita. In all other provinces in the 1990-1997 period, the labour market dampened growth in real GDP per capita. In the 1997-2003 period, labour market conditions largely bolster growth in real GDP per capita in all

provinces but Saskatchewan, Alberta and British Columbia. These three provinces reported the slowest growth in GDP per capita in Canada during this period.

In the North, we see the effects of economic restructuring, with the dramatic upsurge in the employment rate component as the territories engaged in the creation of the infrastructure necessary for industry. The establishment of infrastructure helped increase their GDP per capita. Moreover, labour productivity grew significantly in the Northwest Territories over the period of 1997-2003.

The last driver to growth in GDP per capita is the demographic component, more specifically, the growth in the proportion of the population of working-age. The larger this ratio, the larger the pool of eligible workers that can meet increases in the demand for labour. However, this component does not have a great deal of influence on growth in real GDP per capita. In the future, it is expected that this component will play a larger role in affecting growth in GDP per capita, particularly once the baby boomer generation begins to leave the workforce.

Appendix I

Table A. Compounded average growth of labour market performance (labour intensity + employment rate)

Province	Labour market 1990-1997	Labour market 1997-2003	Change in percentage points
	Percentage		
N.L.	-1.3	2.7	4.0
P.E.I.	-0.5	2.2	2.7
N.S.	-0.5	0.8	1.2
N.B.	0.5	1.1	0.6
Que.	-0.9	0.9	1.8
Ont.	-0.7	0.5	1.2
Man.	0.4	0.2	-0.1
Sask.	0.0	-0.6	-0.6
Alta.	0.2	-0.1	-0.2
B.C.	-0.4	-0.3	0.1
Canada	-0.5	0.5	1.0

Table B. Nominal value of GDP and personal income per capita and labour -market related variables, 2003

Province	GDP per capita	Personal income per capita	Hours worked per Pop 15+	Hours worked per job	Jobs per population 15+
N.L.	\$35,243	\$23,806	862	1,795	48%
P.E.I.	\$28,106	\$24,092	1,133	1,772	64%
N.S.	\$30,883	\$26,265	981	1,721	57%
N.B.	\$29,900	\$25,039	1,000	1,798	56%
Que.	\$33,856	\$27,506	974	1,679	58%
Ont.	\$40,346	\$30,940	1,108	1,743	64%
Man.	\$32,708	\$26,389	1,105	1,716	64%
Sask.	\$36,749	\$25,038	1,095	1,754	62%
Alta.	\$54,075	\$33,086	1,259	1,807	70%
B.C.	\$35,041	\$27,967	992	1,677	59%
Y.T.	\$43,431	\$36,591	1,120	1,648	68%
N.W.T.	\$85,983	\$41,061	1,445	1,641	88%
Nvt.	\$32,634	\$30,404	979	1,627	60%
Canada	\$38,495	\$29,204	1,065	1,727	62%

Table C. Nominal value of GDP per Capita, 1990, 1997, 2003

Province	1990	1997	2003
N.L.	\$15,949	\$19,116	\$35,243
P.E.I.	\$16,616	\$20,572	\$28,106
N.S.	\$18,681	\$21,843	\$30,883
N.B.	\$18,184	\$22,384	\$29,900
Que.	\$21,892	\$25,902	\$33,856
Ont.	\$27,465	\$32,004	\$40,346
Man.	\$21,881	\$26,186	\$32,708
Sask.	\$21,077	\$28,640	\$36,749
Alta.	\$28,760	\$37,825	\$54,075
B.C.	\$24,113	\$28,968	\$35,041
Y.T.	\$38,021	\$34,821	\$43,431
N.W.T. ⁹	\$37,040	\$39,855	\$64,193
Canada	\$24,548	\$29,516	\$38,495

⁹ Northwest Territories in 1997 included Nunavut.

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